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2002

EPA Superfund
Explanation of Significant Differences:

PALMERTON ZINC PILE
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OU 02
PALMERTON, PA
08/27/2002

EXPLANATION OF SIGNIFICANT DIFFERENCES

Palmerton Zinc Pile Superfund Site

Palmerton Borough
Carbon County, Pennsylvania August, 2002

I. INTRODUCTION

Site Name:	Palmerton Zinc Pile Superfund Site
Site Location:	Palmerton Borough, Carbon County, Pennsylvania
Lead Agency:	U. S. Environmental Protection Agency, Region III ("EPA or the Agency")
Support Agency:	Pennsylvania Department of Environmental Protection ("PADEP")

Statement of Purpose

This Explanation of Significant Differences ("ESD") presents the details of a change to the remedy at Operable Unit 2 ("OU 2"), referred to as the Cinder Bank, of the Palmerton Zinc Pile Superfund Site ("Site"). The remedy for the Cinder Bank was first selected in a Record of Decision ("ROD") issued on June 29, 1988. The primary components of the remedy selected in the 1988 ROD consisted of contouring the slopes of the Cinder Bank, as appropriate, diverting surface water runoff from Blue Mountain away from the Cinder Bank, placement of soil/clay cover over the Cinder Bank, and revegetation. The 1988 ROD also provided for pre-design studies to determine the best methods for controlling or extinguishing the internal fires within portions of the Cinder Bank and treatability studies regarding collection and treatment of surface water runoff from the Cinder Bank through the use of constructed wetlands and lime treatment. In addition, the 1988 ROD required implementation of an inspection, monitoring, and maintenance plan to assure the effectiveness of the remedy.

After the 1988 ROD was issued, additional studies were performed consistent with the ROD in order to fill data gaps and determine the best method for implementing the remedial action. While these studies were ongoing, a Complaint was filed against Horsehead Industries, Inc. and Horsehead Resource Development Company, Inc. (collectively "Horsehead") alleging violations of various environmental statutes, including the Clean Water Act ("CWA"). The basis for the CWA violations was exceedences of National Pollutant Discharge Elimination System ("NPDES") permit limits from outfalls along the Cinder Bank. The consent decree which settled that action provided for remediation of the Cinder Bank, among other things, and many of the tasks performed and to be performed pursuant to the consent decree are consistent with the remedy selected in the 1988 ROD.

This ESD explains EPA's decision to make a change in the type of cap to be installed on the Cinder Bank from 18 inches of soils and 6 inches of clay or soil/bentonite mixture to a cover system consisting of a 3 to 4 inch layer of Ecoloam **1**. In addition, EPA will eliminate the requirement to control or extinguish internal fires within portions of the Cinder Bank. Instead, the burning portions of the Cinder Bank will be monitored and if portions of the fire bum themselves out, those portions will be covered and revegetated using the same methods used for the rest of the Cinder Bank. Access to the Cinder Bank will be restricted. EPA is also eliminating the requirement for constructed wetlands for collection and treatment of surface water runoff from the Cinder Bank.

1 Ecoloam is a proprietary mixture of sewage sludge, flyash, limestone, and seed used as a substrate for establishing vegetation.

This ESD is issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act, as amended ("CERCLA"), 42 U.S.C.§9617(c), and 40 C.F.R.§300.435(c)(2)(i). The remedy modifications explained in this ESD significantly change, but do not fundamentally alter, the remedy selected in the 1988 ROD with respect to scope, performance, or cost. This document will be incorporated into the Administrative Record maintained for the Site, as required by 40 C.F.R.§300.825(a)(2). The Administrative Record is available for review at:

Palmerton Library
123 Delaware Ave.
Palmerton, PA 18075
610/929-1120
Hours: Mon.-Thur., 10 AM to 4PM

U. S. EPA
1650 Arch Street
Philadelphia, PA 19103
Contact: Anna Butch
215/814-3157
Hours: 8 AM to 4PM

II. SUMMARY OF SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

The Site is located in Palmerton Borough, Carbon County, Pennsylvania, in the vicinity of the Lehigh Gap. Attachment 1 is the Site location map. Zinc smelting operations took place within the Borough from 1898 to about 1981. The two former zinc smelters are located separately on east and west sides of the Lehigh Gap where the Aquashicola Creek joins with the Lehigh River. The East Plant is at the eastern end of the Borough, located on the southern side of Aquashicola Creek at the foot of Blue Mountain. The West Plant is located in the western end of the Borough on the northern bank of the Lehigh River. The smelters emitted vast quantities of zinc, lead, cadmium, and sulfur dioxide over the years. This pollution, along with releases from the processing facility currently in operation, led to the defoliation of approximately 2,000 acres on Blue Mountain, deposition of heavy metal contamination within the Borough and the valley, and the stockpiling of approximately 32,000,000 tons of slag. The slag pile, which is called the Cinder Bank, caused pollution of the shallow aquifer 2nd the Aquashicola Creek, which flows through the Borough into the Lehigh River. It was apparently common practice during zinc smelting activities to deposit slag material in this waste pile before it was fully quenched. Therefore, significant parts of the interior of the Cinder Bank continue to burn.

Zinc smelting operations ceased at both plants in about 1981. Since 1981, when Horsehead bought the Facility, it has been operated as a hazardous waste recycling facility. It presently processes electric arc furnace ("EAF") dust, which has the RCRA hazardous waste code K. 061. EAF dust is a residue from the steel mill industry and contains significant levels of several hazardous metals, including lead, cadmium, and zinc.

The Site was included on the National Priorities List ("NPL") in September 1983 because of the threat to human health and the environment posed by the Cinder Bank. Further investigation has indicated that elevated levels of heavy metals are prevalent throughout the Palmerton Area.

EPA divided the Site into four Operable Units ("OUs") because of its size and complexity. Operable Unit 1 ("OU 1") addresses revegetation of approximately 2,000 acres of denuded, non-residential land on the north face of Blue Mountain. Operable Unit 2 ("OU 2") consists of remediation of the Cinder Bank. Operable Unit 3 ("OU 3") consists of remediation of residential soils and interior house dust exhibiting elevated levels of lead, which are a result of historic zinc processing operations, as well as past releases from the EAF dust processing activities. Operable Unit 4 ("OU 4") concerns an area-wide investigation of contamination in the ground and surface waters and includes an Ecological Risk Assessment. The focus of this ESD is OU 2, the Cinder Bank.

On June 29, 1988, EPA issued a ROD for OU 2 of the Site designed to accomplish the following objectives: minimize direct contact with the Cinder Bank; reduce volume of run-off; reduce contamination in run-off; reduce volume of run-on; collect and treat leachate; reduce wind-borne contaminated emissions; and reduce paniculate erosion. The

primary components of the remedy selected in the 1988 ROD consisted of contouring the slopes of the Cinder Bank, as appropriate; construction of surface water diversion channels to assure that runoff from Blue Mountain would be diverted away from the Cinder Bank to a treatment system, if warranted, and leachate from the Cinder Bank would be diverted to the treatment system; construction of a cap consisting of 18 inches of soil and 6 inches of clay or soil/bentonite mixture over the Cinder Bank to prevent infiltration and leaching of heavy metals into the groundwater and seeps contaminated with heavy metals from exiting the Cinder Bank; and placement of a vegetative cover over the cap to stabilize the slopes, prevent erosion, and control surface water movement. The 1988 ROD also provided for pre-design studies to determine the best methods for controlling or extinguishing the internal fires within portions of the Cinder Bank and treatability studies regarding collection and treatment of surface water runoff from the Cinder Bank through the use of constructed wetlands and lime treatment. In addition, the 1988 ROD required implementation of an inspection, monitoring, and maintenance plan to assure the effectiveness of the remedy.

III. REASONS FOR ISSUING THIS ESD

Since issuance of the 1988 ROD, a number of projects and studies have occurred that are relevant to the implementation of the 1988 ROD. It was therefore appropriate to evaluate these projects and studies to determine the status of implementation of the 1988 ROD requirements. The evaluation, described below, shows that the remedy selected in the 1988 ROD is effectively being implemented through measures approved by EPA, the Pennsylvania Department of Environmental Protection ("PADEP") and the United States District Court for the Middle District of Pennsylvania.

On October 14, 1988, the United States District Court for the Middle District of Pennsylvania entered a consent decree in United States of America vs. Zinc Corporation of America. A Division of Horsehead Industries. Inc. Under this consent decree, Horsehead implemented a remedial project for OU 1 of the Site, revegetating approximately one thousand acres of Blue Mountain using Ecoloam as the substrate for establishing vegetation. EPA maintained oversight of the revegetation project and found that the methods used have been largely effective to date in establishing vegetative cover and reducing surface water infiltration.

As stated previously, the 1988 ROD called for pre-design studies regarding the control and/or extinguishment of internal fires within portions of the Cinder Bank. In August 1989, Black & Vetch, Incorporated, completed an Engineering Evaluation and Cost Analysis ("EECA") of OU2 of the Site for EPA. The EECA evaluated various alternatives for remediation of the Cinder Bank, including excavation and quenching of the internal fires. The EECA discussed the significant health and safety issues that would be presented by attempts to excavate and quench the fires and estimated that the cost of such an endeavor would be in excess of $217 million.

In January 1990, EPA requested that the Office of Surface Mining ("OSM") of the United States Department of Interior study the Cinder Bank and evaluate the findings of the EECA regarding the internal fires. OSM concluded that it was feasible to quench the internal fires but not economically justified because the fires did not appear to present a public health and safety hazard. OSM recommended that a comprehensive air quality testing program be performed to determine whether the fires were releasing emissions into the air in excess of Clean Air Act standards, and thereby posing a threat to public health and Safety.

In December 1991, Horsehead agreed to perform additional studies in connection with the Cinder Bank, including implementation of an air monitoring program to determine the quality and quantity of air emissions from the fires to determine any potential health effects. The results of the air monitoring program verified that the fires were not releasing sufficient emissions to present a health threat. Given those findings, OSM determined that covering of the burning areas was preferable to other methods of remediation due to cost and safety concerns.

In 1995, Horsehead entered into a consent decree resolving a Complaint alleging violations of various environmental statutes, including the Clean Water Act, with the Pennsylvania Department of Environmental Resources (succeeded by PADEP) and EPA in the matter captioned United States of America and Commonwealth of Pennsylvania v. Horsehead Resource Development Company. Inc. and Horsehead Industries. Inc., Civil Action No. 92-0008 (M.D. Pa.). The basis for the CWA violations was exceedences of NPDES permit limits from outfalls along the Cinder Bank. The consent decree which settled the action included a requirement that Horsehead design and install Cinder Bank pollution reduction technologies ("PRTs"). The resulting Revised PRT Plan, also known as "the Cinder Bank Plan" was accepted in May 1999. The Cinder Bank Plan provides for the regrading of portions of the Cinder Bank, construction of diversion ditches to divert water runoff from Blue Mountain around the Cinder Bank, treating water to permanently remove metals, and covering and vegetating the Cinder Bank. Many of the tasks required by the Cinder Bank Plan are consistent with and/or duplicative of the remedy selected in the 1988 ROD.

The Cinder Bank Plan has been evaluated to determine whether it addresses all remaining issues related to the Cinder Bank and its immediate environs and as such, represents remediation of all potential releases of hazardous substances from the Cinder Bank. Since the Cinder Bank has been designated OU 2 of the Site, actions taken by Horsehead under the Cinder Bank Plan impact the remedial actions required under CERCLA.

IV. DESCRIPTION OF SIGNIFICANT DIFFERENCES

The Significant Differences between the remedy selected in the 1988 ROD for the Cinder Bank and the remedy that is being implemented at the Cinder Bank under the Revised PRT Plan are summarized below. The following discussion demonstrates that the remedial actions being performed under the Cinder Bank Plan are consistent with the remedial action objectives in the 1988 ROD, and if completed, should accomplish the remedy selected in the 1988 ROD.

The remedial action objectives described in the 1988 ROD include minimizing direct contact with the Cinder Bank; reducing the volume of run-off from the Cinder Bank; reducing contamination in run-off from the Cinder Bank; reducing the volume of run-on from Blue Mountain onto the Cinder Bank; collection and treatment of leachate from the Cinder Bank; reducing wind- borne contaminated emissions; and reducing paniculate erosion. The Cinder Bank Plan will minimize direct contact with the Cinder Bank because the vegetative cover installed as part of the Cinder Bank Plan will form a permanent, self-sustaining barrier over the Cinder Bank. Installation of the vegetative cover over the Cinder Bank will also reduce windborne contaminated emissions and paniculate erosion. The volume of run-off from the Cinder Bank will be controlled by eliminating most of the run-on from Blue Mountain through construction of diversion ditches and controlling precipitation run-off through installation of the vegetative barrier over the Cinder Bank. These actions will likewise reduce the volume of contamination in run-off from the Cinder Bank because any run-off will not have come into contact with the contaminants present in the Cinder Bank. The diversion ditches constructed as part of the Cinder Bank Plan will catch most of the water above the Cinder Bank and route it around the Cinder Bank thereby substantially reducing the volume of run-on from Blue Mountain onto the Cinder Bank. The water that is diverted around the Cinder Bank, and does not come into contact with the Cinder Bank, will be directed to existing wetlands which discharge into Aquashicola Creek. Water that does come into contact with the Cinder Bank flows from the Cinder Bank through a series of seeps that are directed to metal removal zones ("MRZs"). The MRZs consists of large excavated pits that are filled with iron rich material. The contaminated water that enters the MRZs is treated through a reaction in which the pH of the water is raised by the iron rich material thereby allowing the metals to precipitate out. The treated water is then adjusted to the proper pH before discharging into Aquashicola Creek.

The primary significant difference between the 1988 ROD remedy and the Cinder Bank Plan is the type of cap to be installed on the Cinder Bank. The 1988 ROD required a cap consisting of 18 inches of soils and 6 inches of clay or soil/bentonite mixture. The Cinder Bank Plan requires a cover system consisting of 3 to 4 inches of Ecoloam. Ecoloam is the same

soil substrate used to successfully reclaim Blue Mountain as part of the OU 1 remedy. The application rate, however, will be 60 dry tons per acre of biosolids on the Cinder Bank versus 25 dry tons per acre on Blue Mountain. The increased thickness, in addition to supplying nutrients, will provide a cap for the Cinder Bank. The vegetative cover will create a barrier to both wind and water erosion and evapotranspire much of the water falling on the Cinder Bank. Various adapted grass and legume species will be used to form a permanent, self- sustaining vegetative cap. While the type of cap being installed as part of the Cinder Bank Plan will ultimately reduce metal contaminated water from entering surface waters around the Cinder Bank, which is one of the 1988 ROD objectives, it will also significantly reduce the amount of metal contaminated water entering groundwater beneath the Cinder Bank. As a result, this cap will provide protection of human health and the environment which is comparable to that provided by the cap originally required under the 1988 ROD.

The 1988 ROD also required pre-design studies to determine the best methods of controlling or extinguishing the internal fires within portions of the Cinder Bank. As a result of these pre-design studies, on the recommendation of OSM, EPA has determined that the requirement that the fires within portions of the Cinder Bank be controlled or extinguished should be eliminated. Instead, the burning portions of the Cinder Bank will be monitored and if portions of the fire burn themselves out, those areas will be revegetated using the same methods as those used for the rest of the Cinder Bank. Access to the Cinder Bank will be restricted.

The requirement for constructed wetlands for collection and treatment of surface water run-off is also being eliminated. This requirement has been met by the metal removal zones constructed as part of the Cinder Bank Plan.

The 1988 ROD also requires an inspection, monitoring, and maintenance plan to assure the effectiveness of the remedy. This requirement will be partially met by the Operation and Maintenance ("O&M") Plan which was submitted as part of the 1999 Cinder Bank Plan. That O&M Plan currently addresses Cinder Bank vegetation, diversion ditches, and metals removal zone inspections, as well as water quality analysis of the MRZs. That O&M Plan will either be modified or supplemented by a second O&M Plan to include access control measures and inspections of the area of the Cinder Bank that continues to smolder, immediately east of the central portion. Inspections for potential changes in conditions in the burning area, and a contingency plan to address these changes, will be part of the modified or supplemental Cinder Bank O&M Plan.

The cost savings associated with this ESD are significant. The Feasibility Study which was performed for OU 2 estimated that the cost of implementing the selected remedy in the 1988 ROD would be $12,519, 000. That cost estimate did not include the pre-design studies or the treatability studies required by the 1988 ROD. The cost of implementing the remedy as described in this ESD is estimated to be $3 million to $5 million.

V. SUPPORT AGENCY COMMENTS

All of the changes to the remedy have been coordinated with representatives of PADEP pursuant to 40 C.F.R.§300.435(c)(2). PADEP has agreed that the changes to the remedy at OU 2 will continue to provide protection and meet the objectives in the 1988 ROD.

VI. STATUTORY DETERMINATIONS

EPA has determined that the revised remedy complies with the statutory requirements of Section 121 of CERCLA, 42 U.S.C.§9621. Considering the additional information that has been identified and the changes that have been made to the remedy, EPA believes that the remedy remains protective of human health and the environment, is equivalent to Federal and State requirements that are applicable or relevant and appropriate to this Remedial Action as described in the 1988 ROD, and is cost-effective.

VII. PUBLIC PARTICIPATION

This ESD has been included in the Administrative Record for OU 2 of the Palmerton Zinc Pile Superfund Site. The Administrative Record also includes the 1988 ROD and all documents that formed the basis for EPA's selected remedy. The Administrative Record is available for public review at the location listed above.

8/27/02

Date

Abraham Ferdas, Director
Hazardous Site Cleanup Division